# **XXV. NWA 998** (ver. 2003)

clinopyroxenite 456 grams

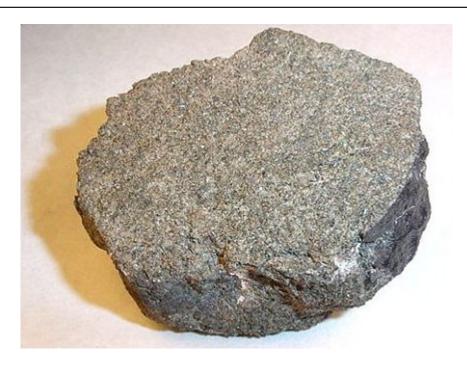


Figure XXV-1: Photograph of piece of NWA 998 by Adam and Greg Hupé.

#### Introduction

Irving *et al.* (2002) report that a piece of a nakhlite was acquired in Morocco in September 2001. Figure XXV-1 shows what appears to be a broken "slab", with a fusion crust around the outside.

#### **Petrography**

The texture of NWA 998 is that of a hypabyssal, adcumulate igneous rock. According to Irving *et al.* (2002), the crystallization sequence was olivine, orthopyroxene, titanomagnetite, augite, apatite and plagioclase.

## **Mineral Chemistry**

*Olivine:* Olivine is Fo<sub>36</sub>.

**Pyroxenes**: The dominant mineral is clinopyroxene Wo<sub>39</sub>En<sub>78</sub>. Minor othropyroxene is Wo<sub>4</sub>En<sub>51</sub>. Pyroxene contains tiny melt inclusions.

**Plagioclase**: Interstitial plagioclase exhibits normal birefringence and is  $An_{30}$ .

*Opaques*: Symplectitic intergrowths of titanomagnetite and low-Ca pyroxene are present at grain boundaries between large, discrete olivine and titanomagnetite grains. Cr-titanomagnetite inclusions occur within olivine.

**Secondary minerals:** Ankeritic carbonate, K-feldspar, (?) serpentine, calcite and a Ca-sulfate are present on grain boundaries. Irving *et al.* (2002) suggest that these *secondary minerals* may have a pre-terrestrial origin.

## **Whole-rock Composition**

None reported

#### **Other Isotopes**

Oxygen isotopes of acid-washed augite as determined by D. Rumble (reported by Irving), were  $\delta^{18}O = +3.9 \pm 0.2$ ,  $\delta^{17}O = +2.2 \pm 0.01$  and  $\Delta^{17}O = +0.24 \pm 0.01$  ‰.